

Descriptions of New Vertebrata from the Upper Tertiary Formations of the West.

By E. D. COPE.

(Read before the American Philosophical Society, December 21, 1877.)

PITHECISTES BREVIFACIES gen. et spec. nov.

Char. gen. These are chiefly known from a mandible which supports the dentition of one side and part of the other. The dental formula is I. 1 ; C. 1 ; Pm. 3 ; M. 3. The single incisor of each side is weak and easily lost, and there is on one side only, a small alveolus for a minute second incisor. It is therefore probable that in some individuals the incisive formula is 2. The canine is not large, and closes in front of the superior canine in the usual manner. The first and second premolars are one-rooted, and their crowns are wider than long. That of the third premolar is robust, but longer. The molars increase rapidly in size, and are not prismatic, but are well rooted. They are worn in the specimen, but their structure is probably shallow selenodont. The last molar has a long heel or fifth lobe.

Char. specif. The mandibular ramus is very deep posteriorly, and the incisive border is not prominent. The canine tooth is quite small, its transverse diameter being less than that of the first premolar, and equaling it antero-posteriorly. The exterior incisor is weak, and the crown expanded transversely, and obtuse. The crown of the first premolar is worn deeply by the superior canine. The transverse diameter at the base of the crown exceeds the antero-posterior. The crown of the second is wider than long, and of the third longer than wide. The molars increase rapidly in size posteriorly, so that the length of the third equals that of the three premolars plus the canine. The heel is long, and is connected with the remainder of the crown by a narrow plate, or in section, an isthmus. There are no cingula, but an accumulation at the bases of some of the teeth resembles the deposit of "tartar." The symphysis is very robust, and its upper surface is marked on each side by a low longitudinal swelling. The opposite premolar series are slightly convergent.

The form of the mandible of this animal, as well as the number and proportions of the teeth, curiously resemble that of the corresponding part of a monkey. The species was about the size of a red fox.

<i>Measurements.</i>	M.
Length of ramus from heel of molar III.....	.057
" molar series.....	.048
" premolar series.....	.015
" second true molar.....	.010
Width " " .....	.007
Length of last molar.....	.018
Width of " at front.....	.007
Length of symphysis in front.....	.020
Depth of ramus at first premolar.....	.017
" " second true molar.....	.025

BRACHYMERYX FELICEPS gen. et sp. nov.

Char. gen. These are derived from the superior dental series. These are I.²; C.¹; Pm.³; M.³. The true molars have the bases of the crowns little swollen, and the last two of the superior series are but shortly rooted; the anterior ones have longer roots. The true molars are simply selenodont, with the anterior extremities of the external crescents forming prominent ribs. The last superior premolar consists of two columns posteriorly and a single trenchant one anteriorly, and the second (first of the series,) is simple and trenchant. The worn posterior face of the canine shows that the first inferior premolar is the functional canine as in *Oreodon*. There is a very slight diastema in front of or behind the canine, the series being continuous, as in *Oreodon*.

This genus differs from *Pitheciastes* in its canine like first inferior premolar, and in the trenchant character of the anterior premolars. With *Cyclopidius* it enters the family group of the *Oreodontidae*, but approaches the suilline types still more nearly in its probably coössified symphysis mandibuli.

Char. specif. This ungulate was a little smaller than the species last described, and is represented in my collections by two nearly complete crania without mandibles. The head is depressed and the zygomata widely expanded; the palate is wide, and the muzzle short. The infraorbital foramen is double and issues above the adjacent parts of the second and third (last) premolars. Immediately in front of it the side of the face is concave.

The projecting anterior angles of the external crescents of the molars are very prominent, forming strong vertical ribs. The external border of the last premolar is only interrupted by a little convexity. The anterior narrow portion of the second premolar is incurved. This tooth is two-rooted; the first is one-rooted. The canine is small and strongly recurved. It is cylindrical at the base, but beyond this is narrowed antero-posteriorly partially from the friction of the first inferior premolar. The anterior face is regularly convex. The first premolar has a very slight internal basal cingulum; its cutting edge is directed obliquely to the long axis of the cranium. There are no cingula on the other teeth. The enamel of the true molars is smooth on the external side of the crown. There is no enamel on the inner walls of the central lakes.

Measurements.

M.

Length of dental series to anterior border of canine.....	.050
“ premolar series.....	.017
“ last true molar.....	.012
Width of “ “.....	.006
Length of first true molar.....	.007
Width of “ “.....	.006
Length of first premolar.....	.006
Width of “ “.....	.006
Length of canine tooth.....	.009

<i>Measurements.</i>	M.
Diameter of canine tooth (transverse).....	.004
Width of cranium between first premolars.....	.016
" " " last molars.....	.030

The cranium of this species is about the size of that of a large domestic cat.

CYCLOPIDIUS SIMUS. Gen. et. sp. nov.

Char. gen. Dental formula I. $\frac{2}{2}$; C. $\frac{1}{1}$; Pm. $\frac{1}{1}$; M. $\frac{3}{3}$. The superior canine is small and is separated from the first premolar by a very short diastema. First premolar simple, trenchant; second premolar two rooted, with one principal cutting edge; third with an external crescent and a rudimental internal one, not united in front. Fourth premolar with the inner and outer crescents only, and these well developed. Last true molar without heel. Inferior canines with much wider crown than the incisors with which it is in close association. First premolar canine-like, but not very large; second premolar simple. Third and fourth premolar with the anterior portions trenchant, the posterior with wide or double columns. Last true molar with large fifth crescent or column. True molars of both jaws prismatic. Symphysis mandibuli coössified.

Frontal bones much abbreviated in front by a large upwards-looking fossa on each side, which are separated by the very narrow and short nasal bones. There are lachrymal fossæ and a huge foramen in front of them, which communicate with the maxillary sinus. There is a prominent transverse supraoccipital crest, and the otic bullæ are greatly inflated.

This genus is related to *Leptauchenia*, Leidy, but differs in having but two lower incisors below. That genus belongs to a lower horizon, the miocene of White River, while the present form is its successor in the upper Miocene or Loup Fork beds. The remarkable character of the vacuities in the superior region of the front part of the cranium, reminds one of the existing genus *Sæga*. Dr. Leidy partially described a similar structure in *Leptauchenia*. In this genus what are clearly nasal bones in *Cyclopidius*, he terms frontals, probably by error.

Char. Specif. This animal is rather larger than either of those above described, and is represented in my collection by one nearly complete cranium, one entire left maxillary bone, and the under jaws of five, and probably of several other individuals.

The skull is wide and abbreviated in front. The maxillary bones are everted on each side of the external nares. The malar bone is very wide or deep, and sends upwards a strong postorbital process, which is broken off in part, but which probably completed the orbit. The superior facial fossæ reach backwards nearly as far as the middle of the orbit. They are longitudinal narrow ovals, open in front. The projecting supraorbital portions of the frontal bone with the nasals have a tripod form. The lachrymal fossa looks outwards, upwards and forwards, and the large maxillary foramen outwards. The infraorbital foramen is double, and issues above the contiguous portions of the third and fourth premolars.

The external crescents of the true molars present prominent anterior angles, which form strong vertical ribs. The first superior premolar has a weak, and the second premolar a very strong internal basal cingulum; there are no other cingula. The diastema is as wide as the diameter of the canine.

The first inferior premolar is one-rooted, and the second two-rooted, and both are longer than wide in horizontal diameter. The middle pairs of incisors are very small; the external one on each side is much larger, the diameter equaling half that of the canines. The first and second true molars are subequal, and are together longer than the third, which does not quite equal in length the three premolars. The heel of the last molar is not so long anteroposteriorly as each of the other columns. The symphysis is steep, but is everted at the incisive region.

<i>Measurements.</i>	M.
Length of ramus from heel of m. III.....	.065
“ of molar series.....	.036
“ of premolar series.....	.016
“ of second true molar.....	.011
Width of “ “ “ .....	.006
Length of third “ “ .....	.016
Width of “ at front.....	.006
Length of symphysis in front.....	.025
Depth of ramus at first premolar.....	.022
“ “ second true molar.....	.025
Width between superior anterior premolars.....	.014

CYCLOPIDIUS HETERODON sp. nov.

This species is represented by a portion of the right maxillary bone, which supports the last premolar, first true molar, and portions of other teeth. It is a smaller form than the *B. simus*, and differs in several important respects. The infraorbital foramen is single and larger than those of the other species. The fourth premolar, while of the same constitution as that of *M. simus*, is relatively much smaller, not equalling in the extent of its grinding face one column of the first true molar. The latter is prismatic, and of usual form. Its external crescents are not produced as in *B. simus*, so that there are no distinct vertical ribs.

<i>Measurements.</i>	M.
Diameter of last premolar { anteroposterior.....	.0050
{ transverse.....	.0045
Diameter of first true molar { anteroposterior.....	.0080
{ transverse..	.0055

This species was found with the three preceding in the Upper Miocene of Montana by my assistant, J. C. Isaac.

BLASTOMERYX BOREALIS sp. nov.

This genus was defined by me in the fourth volume of the Report of Lieut. G. M. Wheeler to the Chief of Engineers, 1877, p. 350, as not cer-

tainly distinct from *Dicrocerus* Lartet. The discovery of a second species of the group, which displays the characters there pointed out, in a still more striking degree than the species on which it was formed, renders it necessary to introduce the genus formally to the system. In brief its molars differ from those of *Dicrocerus* much as those of the deer differ from the molars of the antelope. While *Dicrocerus* was probably the ancestor of *Antilocapra*, *Blastomeryx* was the ancestor of *Cervus* or *Cariacus*.

The superior dental formula is I. 0; C. 0; Pm. 3; M. 3. The molars all have two pairs of crescents excepting the last premolar, where the posterior pair are rudimental. The external face of the anterior crescent in all the molars presents a groove, which is bounded posteriorly by a vertical ridge. The posterior crescent is directed a little inward posteriorly on the true molars. The palate is much contracted in front of the first molars. The horns stand above the posterior parts of the orbits; their section is triangular, the posterior angle being rounded, and the external produced and acute, bounding the orbit outwards and backwards. There is no trace of burr. The temporal fossæ approach so as to be separated only by a rather wide and low occipital crest.

<i>Measurements.</i>	M.
Total length of skull.....	.320
Length of molar series.....	.107
" premolar ".....	.049
" second premolar.....	.016
Width " ".....	.011
Length of first true molar.....	.020
Width " ".....	.015
Width between bases of horn-cores.....	.050
Transverse diameter of horn-core two inches from base. .	.040
Width between external borders of first true molars....	.078
Width of palate in front of first premolars.....	.028

This species was as large as the black-tailed deer, *Cariacus macrotis*. It was found by my assistant, J. C. Isaac, in the Upper Miocene of Montana.

CERVUS FORTIS sp. nov.

This deer is of large size, much exceeding any living species of the family *Cervidae*. It is represented in my collections by a superior molar of the left side, and very probably by other remains which accompanied it, viz.: a mandibular symphysis with incisor and canine teeth; calcaneum. astragalus, vertebræ, etc. These were found at the same time and place by George M. Sternberg, M.D., U. S. A., already well-known by his interesting discoveries in the cretaceous formation of Kansas.

The plicæ which mark the anterior extremities of the external crescents are very prominent, and are directed forwards rather than outwards. The median lakes are narrow and well separated medially. The posterior lake has a strong fold of its internal border, forming a lobe directed backwards.

A cylinder of small diameter stands near the apex of the fold of the internal enamel wall, which separates the internal crescents. There is a cingular ridge descending inwards on the interior and posterior extremities of the base of the crown, and below and exterior to it the enamel surface is very rugose. The surface of the external enamel is smooth. The enamel of the lake borders is seamed with shallow vertical sulci. The crescents are wide and the lakes narrow.

The reference of this species to the genus *Cervus* may require reconsideration.

<i>Measurements.</i>	M.
Anteroposterior diameter of crown.....	.052
Transverse do. in front.....	.035
Width of anterior external crescent.....	.018
Elevation of crown externally.....	.020

From the pliocene formation of Oregon.

The Loup Fork beds have been usually referred to the Pliocene horizon, but I have offered reasons why they should be regarded as of Upper Miocene age. The horizon from which this and some other species herein described, found in Oregon, represent the Pliocene formation much more nearly.

DICOTYLES SERUS, sp. nov.

This species of hog is indicated by a mandibular ramus which lacks the angles, and supports the dentition of both sides excepting the third right molar. Other portions of the skeleton are associated. A second specimen is the symphysis with the incisor teeth. The remains indicate an animal something larger than the white lipped peccary *Dicotyles labiatus*.

Dentition of the mandible, I. 2; C. 1; P. m. 3; M. 3. Inferior canines triangular; superior canines decurved, triturating the inferior. Last inferior molar with well developed heel. Last premolar like the first molar. First premolar with anterior single tubercle and posterior lower tubercle heel; second premolar similar but wider, and the anterior tubercle divided. Molars consisting of four principal tubercles opposed in pairs, with some accessory ones between them.

The rami are robust and of moderate depth; the symphysis is elongate and contracted. The suture of the latter remains on the inferior side, but is obliterated on the upper surface. The symphysis is trough-like and the narrow alveolar ridges of the diastema are concave inwards.

The incisor teeth are directed forwards, and are closely approximated and parallel. The fang of the second lies close to that of the canine, and the edges of the crowns together form a parabola, the enamel being prolonged posteriorly on the external side of the external tooth. The crowns of the median teeth are not expanded laterally, nor much depressed at the apex; as half worn in the specimen, they form a wide transverse oval. The canines curved upwards and outwards and present their triturating surface a little external to directly backwards. Their section is tri-

angular, the lateral faces being longer than the posterior, and the anterior angle is a narrow one. The surface of the enamel cannot be described, as it is eroded at some points. The diastema is long.

The first (homologically second) premolar is narrow, and is without lateral or posterior lobe or cingulum, but a third is a rudimental lobe at its anterior base. The heel presents an interior tubercle, and a narrow postero-external lobe which embraces a medeo-external tubercle. The latter becomes the external posterior tubercle on the true molars. The third premolar is larger and wider than the second; the medio-external lobe becomes more external and posterior, and a median tubercle appears in front of it. The posterior tubercle still sends a narrow ledge round to the outer base of the medio-external lobe. The anterior lobes are more elevated than the others, and are only separated by a fissure. In the fourth premolar the true molar structure is seen in the regular quadri-tuberculate form. There is a small tubercle in front and behind the notch of lobes, and a fold descending forwards on the outer side of the external posterior lobe. In the second true molar there is an additional tubercle on the middle line between the pairs of lobes. The median accessory tubercles are not distinct on the last molar, excepting the posterior, which becomes a large heel. The lobes of each pair are not deeply separated on the last two molars. These teeth are rather abruptly larger than the first true molar, which is little larger than the last premolar. Each of them has a narrow anterior cingulum, but no other. The enamel is nearly smooth.

<i>Measurements.</i>		M.
Length of mandible from end of posterior molar to incisive alveoli.....		0.190
Length of molar series.....		.103
" true molars.....		.062
" diastema .....		.054
Width between bases of canines.....		.020
" of diastema.....		.024
" between bases of first premolars.....		.032
Diameter of p. m. 2	{ antero-posterior.....	.012
	{ transverse.....	.007
Diameter of p. m. 4	{ transverse.....	.015
	{ antero-posterior.....	.012
Diameter of m. 2	{ antero-posterior.....	.021
	{ transverse.....	.016
Diameter of m. 3.	{ antero-posterior.....	.026
	{ transverse.....	.015

The animal from which the above description was taken was adult. It was discovered in the Loup Fork beds of North-Western Kansas by Russell Hill of this city.

TETRALOPHODON CAMPESTER sp. nov.

The cranium and under jaw, with nearly complete dentition, including tusks, of this species, were obtained by my assistant, Russell S. Hill. The

animal is mature but not old, as the second true (third intermediate) molar is present and much worn, and the last molar is worn on its anterior three-fifths.

The posterior or fourth crest of the second true molar is narrower than the third, and is not followed by a heel. The third molar presents six transverse crests, and so large a heel that it might be said to be seven-crested. Each crest is sub-transverse, and is composed of a principal obtuse cone at each extremity and some smaller ones between, in close contact. The apices of the larger ones approach each other, and the median ones are less elevated. The section produced by wearing of the third and second crest each, is that of two trefoils placed base to base, and the lateral lobes of these, completely close the valley between those crests. The valleys between the other crests are closed by one or two distinct median tubercles, and the sections of those crests are less accurately trifoliate than those of the others. There is a very large cingulum at the anterior extremity of this tooth whose worn section is confluent with both of the trefoils of the anterior crest near the middle. A portion of it is isolated on the inner side of the crown, forming a flattened cone, or when worn, an isolated oval with the long axis directed inwards and forwards. This I have counted as the first crest, as it is as much entitled to it as the one so counted by Dr. Falconer, in the *T. sivalensis*. The palate is narrow, not exceeding the width of the second true molar.

The mandibular rami are of rather light tissue, and are compressed in form, the external face being little convex. The symphysis is produced, without abrupt contraction either laterally or below, into a robust beak whose depth is equal to the width five inches beyond the bifurcation. It is channeled above by a narrow and deep groove, and supports no tusks. From the appearance of the tissue when fractured transversely it is evident that there have been no alveolar cavities at any time. The beak is slightly decurved and the extremity is depressed and transversely flattened. The superior incisor possesses a broad band of enamel, which covers nearly one-third the diameter of the tooth.

<i>Measurements.</i>		M.
Length of crown of second true molar.....		.118
Width " " " .....		.075
Length " third " .....		.195
Width " " " .....		.080
" palate at anterior extremities of second molars		.045
" " posterior crests of third " "		.095
Length of ramus from posterior border to bifurcation....		.560
Length of symphyseal beak (broken).....		.480
Depth of do. five inches from bifurcation.....		.118
Width of do. at do. ....		.115

This fine new *Mastodon* is the second species of the genus *Tetralophodon* found as yet in North America, the first being the *T. mirificus* of Leidy.

It is well distinguished from this form by the structure of the component parts of the crown of the last molar tooth, and by its long symphysis, that of the *T. mirificus* possessing the more usual short spout. It is with the *T. longirostris*, of Eppelsheim and the valley of the Danube, that the closest affinity exists. In *T. campester* the symphyseal production is much more robust, not being separated from the rami by any constriction, as in *T. longirostris*. It is moreover without incisive tusks, but it is yet uncertain what value should be attached to this character, as it may turn out to be individual or sexual. In the intimate structure of the molars there is considerable resemblance to the *T. longirostris*; that species is however stated by Dr. Falconer* to possess but five crests and a heel on the last molar. The presence of the enamel band on the tusks also separates the *T. campester* from that species, where, according to Mr. Vacek,† it is wanting.

In comparison with *M. sivalensis*, this Mastodon differs in the transverse character of the valleys; in the Indian species the tubercles alternate and close them.

The dimensions of the *T. campester* are those of the African Elephant. From the Upper Miocene and Loup Fork horizon of Kausas.

TAXIDEA SULCATA sp. nov.

This badger is represented by the nearly entire maxillary bone of the left side containing all the teeth excepting the canine and first premolar. It resembles the corresponding portion of the *T. americana* very nearly, but differs in two important features. The first of these is the abbreviation of the anterior portion of the dental series. The first premolar is closely wedged in between the canine and second premolar, so that its anterior root is almost obsolete. The head was thus doubtless relatively shorter than in the existing species where there are hiatuses between the roots of the first premolar and adjacent teeth. The second character is seen in the last or true molar. On its crown the tubercles are arranged in two well separated transverse rows, forming crests by their confluence, which are separated by a deep valley, and bound by a half valley in front and rear.

<i>Measurements.</i>	M.
Length of series, including canine.....	.038
“ premolars.....	.023
“ last premolar.....	.011
Width of “ “.....	.009
Length of last molar (inside).....	.012
Width “ “.....	.010

From the Pliocene of Washington Terr.; found by Major Truax, U.S.A.

* On British and European Fossil Mastodons, p. 19 (8 vo.).

† Ueber Oesterreichische Mastodonten Wien, 1877, p. 31 (Abh. K. K. Geol. Reichsanstalt).

PSEUDEMYDYS BISORNATUS SP. NOV.

This fresh water tortoise is represented by portions of three individuals. These exhibit a rather flattened convex carapace, with marginal bones united (behind the bridge at least), without gomphosis, by fine suture. There are no median or lateral keels. The vertebral bones are nearly as wide as long, and thick; the costals are thickest proximally and thinnest medially. The marginals are quite stout. The dermal scutal sutures are deeply impressed, especially those defining the marginal scuta.

The sculpture of the superior surface of the carapace is strongly marked and peculiar. The vertebral scutal areas are smooth, or display only a few obscure ridges directed backwards and inwards, on the proximal portions of the costal bones; the vertebral bones being smooth. The costal scuta present two forms of sculpture; posterior to the intercostal bony suture each is reticulated with inosculating sharp ridges whose general direction is longitudinal proximally and transverse distally. The sculpture is Trionyx-like, and rather coarse. The surface anterior to the osseous suture, is ornamented with raised, parallel ridges, which are separated more widely than those of the posterior half of the scutum, and which do not inosculate. They continue uninterruptedly to the succeeding osseous suture, to be followed again by the reticulate pattern. Thus each costal bone is divided into three areas; a proximal smooth one, and an anterior reticulate, and posterior ridges areas, separated by a deep sutural groove.

A postero-lateral marginal bone unites subequally with two costals. Its superior surface rises in abrupt convexity beyond the costo-marginal dermal suture, and from the transverse intermarginal dermal suture. It is then concave to the recurved margin. Its sculpture consists of transverse ridges, separated by grooves of equal width.

<i>Measurements.</i>	M.
Length of a vertebral bone.....	.035
Anterior width of same.....	.032
Thickness of same anteriorly.....	.009
Extent of median costal	{
antero-posterior.....	.035
transverse.....	.117
Median thickness of do.....	.006
Distal " ".....	.007
Length of a posterior marginal.....	.030
Width " ".....	.042
Thickness " ".....	.017

This tortoise is at first sight apparently singular in its marks of ornamentation. On comparison with existing species, however, it is seen to present an exaggerated condition of the sculpture characteristic of some of the existing *Pseudemydes* of our Southern rivers; e. g. the *P. elegans*. It is more robust in all its proportions than any of these.

The fossil remains were discovered by my friend, G. W. Marnock, in the pliocene of South-western Texas.

CISTUDO MARNOCHII.

Represented by the posterior lobe of the plastron of an individual of twice the bulk of the existing North American *Cistudos*. It is broadly rounded posteriorly, and there is an emargination at the femoro-anal dermal suture. The anterior suture is straight, as is also the lateral, which measures more than a third the length of the entire lobe. On the upper side of the angle included by these sutures is the fossa for fixed attachment with the carapace. The beveled face of the fore edge of the lobe is quite wide. The dermal sutures are well marked. The anal scuta are large, their median length being half that of the lobe. The common femoral suture is only half as long as the ventral. The inferior surface is nearly flat in every direction; and the surface is smooth. The posterior border of the specimen is broken away.

This species was obtained from the same formation as the last, by Gabriel W. Marnock, to whom I dedicate it.

ANCHYBOPSIS BREVIARCUS sp. nov.

The genus to which the above name was given, was established by the writer in 1870, for a species Cyprinoid fish, from the pliocene formation of Idaho. Its affinities were then stated to be to *Alburnops* (*Hypopsis*), and related existing genera. The present paper describes two additional species of the genus, both of which are represented by pharyngeal bones and teeth of both sides. The teeth are shown to be 5-5, in contradistinction to the genera *Hemitremia* and *Alburnops*, where they are 5-4 and 4-4 respectively.

In this fish the common base of the pharyngeal teeth rises upwards, so as to project well in front of the general plane of the bone. The superior teeth are more compressed than the inferior, and the first and second counting from below, have convex grinding faces. The pharyngeal bone has a short inferior and a long superior limb. The alate portion is regularly and strongly convex, without abrupt expansion. The nutritive foramina of the anterior face are two large inferior and several small superior ones.

<i>Measurements.</i>	M.
Vertical extent of bone in a straight line.....	.020
Width at second tooth.....	.008
“ at first “ .....	.004
Length of tooth line.....	.011
“ of third tooth.....	.005
“ of basal limb to first tooth.....	.009

This species is of smaller dimensions than the *A. latus*.

ANCHYBOPSIS ALTARCUS sp. nov.

The pharyngeal bones of this cyprinoid are larger and of more slender proportions than those of the *A. breviarcus*. Specimens from both sides are preserved. The inferior and superior limbs are both elongate, the former slender, the latter flat. The ala is abruptly expanded at right angles to the long axis; the external border is thence nearly straight to, and the angle of

the superior border situated interiorly to, the line continuing the inner border upwards. The tooth line is elevated at the upper extremity. The basal teeth are more robust than the others, and do not present grinding faces. The nutritive foramina are more numerous and smaller than in the *A. breviarcus*.

<i>Measurements.</i>	M.
Vertical extent of right pharyngeal.....	.023
Width at second tooth.....	.009
“ at first “ .....	.004
Length of tooth line.....	.012
“ of third tooth.....	.006
“ of basal limb to first tooth.....	.011

Found with the last species by Chas. H. Sternberg, in the Pliocene deposit of Oregon.

ALBURNOPS ANGUSTARCUS sp. nov.

Represented by the pharyngeal bones of both sides, of a species of about the size of the one last described. The characteristic marks of these are seen in the long extremities, both inferior and superior, and in the very slight convexity of the ala, which is less prominent than in any of the *Cyprinidæ* here described. The superior end of the tooth basis is elevated and prominent. In one of the jaws all the teeth display a masticating surface. In the other the second tooth, the only one preserved, is partially worn.

The length of the proximal limb distinguishes this pharyngeal bone from that of the *Anchybopsis breviarcus*, if the generic characters be disregarded. From all the other species the slight prominence of the ala separates it.

<i>Measurements.</i>	M.
Vertical extent of right pharyngeal.....	.023
Length of proximal limb.....	.010
“ of tooth line.....	.010
“ of distal limb.....	.012
Width at first tooth.....	.005
“ of second tooth.....	.007
Length of third tooth.....	.005

Found by Mr. Sternberg, with the last species.

ALBURNOPS GIBBARCUS sp. nov.

One left and two right pharyngeal bones furnish the characters of this species. Their form is angulate, as in the *Anchybopsis altarcus*, but shorter in the vertical direction. The proximal limb is rather short, and the distal one not as long as in the species last described. The ala widens abruptly at the inferior margin, and the thin superior edge of the superior limb is obtusely angulate. The nutritive foramina are rather numerous. The first and second teeth display little or no grinding surface.

<i>Measurements.</i>	M.
Vertical extent of right pharyngeal.....	.020
Length of proximal limb.....	.009
“ of tooth line.....	.009
“ of distal limb.....	.009
Width at first tooth.....	.004
“ at second tooth.....	.008
Length of third tooth.....	.005

Found by Chas. H. Sternberg in the Pliocene of Oregon.

On some Saurians found in the Triassic of Pennsylvania, by C. M. Wheatley.

BY E. D. COPE.

(Read before the American Philosophical Society, Dec. 21, 1877.)

THECODONTOSAURUS GIBBIDENS sp. nov.

The only remains of this saurian which have come into my hands are two teeth. They are in good preservation, lacking only the great part of the root. They present the leaf-like outline characteristic of the genus, the crown being strongly distinguished from the narrower root. The form is quite robust, and contracts gradually to the apex. The cutting anterior and posterior edges bound the inner face of the crown, from which they are separated by a groove along their bases. They are interrupted by coarse serrations, the apices of the denticles being directed upwards. These are much reduced in size at the base of the crown. The cutting edges are not separated from the external face by grooves. This face is very convex and perfectly smooth. The inner face is convex between the grooves and is marked with six or seven continuous sulci, which are obsolete at the base.

The saurian which possessed the tooth described was not of large proportions. The species differs from the English form in many respects; e. g., the greater convexity of the external face; the basal grooves of the cutting edges, the grooving of the inner face, the abrupt constriction below the base of the crown, etc.

<i>Measurements.</i>	M.
Diameter of crown { antero-posterior.....	.0070
{ transverse.....	.0045
Length of crown.....	.0038